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| 10/015,042      | 10/26/2001  | James R. Wangerow    | IGT-1419            | 6266             |

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
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1764

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/015,042

Applicant(s)

WANGEROW ET AL.

Examiner

Basia Ridley

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 10-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 012902.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. The examiner notes that the applicant was correct in interpreting the prior Office action as a restriction requirement and not as an election of species requirement, as inadvertently referred to in first paragraph of said prior Office action.
2. Applicant's election with traverse of Invention I and further of Invention A in the reply filed on 20 May 2004 is acknowledged.

Regarding the restriction between the process and apparatus, the traversal is on the ground(s) that the process cited by the examiner in support of said restriction requirement is not materially different from the process claimed by applicant in the subject application, because the only difference between said processes is merely a degree to which one of the process steps is carried out. This is not found persuasive. The processes to produce product streams having different compositions are materially different from each other because said composition can be affected by various process variables, such as reaction temperatures and pressures, specific catalysts used, reactant flow-rates through various reactors, etc. Therefore a process which requires a specific composition of a product stream is materially different than a process which is not limited to any specific composition of said product stream.

Regarding the restriction between the subcombinations usable together, the traversal is on the ground(s) that the examiner has not identified the two or more claimed subcombinations as required by MPEP § 806.05(d), and that the examiner has not shown how said subcombinations are separately useable. This is not found persuasive. In prior Office action the examiner has identified Invention A (as recited in claim(s) 1-9, drawn to a reactor for conversion of hydrocarbon

Art Unit: 1764

fuel, classified in class 48, subclass 127.9) and Invention B (as recited in claim(s) 17, drawn to a system for producing electricity, classified in class 429, subclass 19). Further the examiner has stated that "Inventions A and B are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention B has separate utility such as production of electricity. See MPEP § 806.05(d)." Applicant's arguments that a recitation of an "apparatus for conversion of a hydrocarbon fuel to a fuel gas suitable for use in a fuel cell" in some of the claims drawn to the reactor, as set forth above, establishes that both subcombinations have the same utility is not persuasive, because said recitation does require that said fuel gas is used in a fuel cell to produce electricity. Said product gas, while suitable for use in fuel cell, can be used in various other applications, for example, as a reactant in various chemical processes. Applicant's arguments that the restriction requirement is improper as indicated by MPEP § 806.05(c)II are not found persuasive because cited section of MPEP, while pertinent to a restriction requirement between combination and subcombination, is not pertinent to a restriction requirement between subcombinations useable together, as set forth in previous Office action (see first paragraph of MPEP § 806.05(c)).

The requirement is still deemed proper and is therefore made FINAL.

3. Claims 10-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Inventions, there being no allowable generic or linking claim.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1764

5. Claims 4 and 8-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 8-9 recite the limitation(s) “methanation catalyst is selected from the group consisting of nickel, iron, ruthenium, platinum, rhodium and alloys and combinations thereof”. Said claims are indefinite, as the alternative expression is in a form of improper Markush group. Proper Markush group recites its members as being “selected from the group consisting of: A, B, and C”. See MPEP 2173.05(h).

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Edlund et al. (USP 5,997,594).

Regarding claims 1-2, Edlund et al. discloses a reactor for CO control comprising:

- a reactor vessel (50) having a water-gas shift catalyst zone and a methanation catalyst zone disposed downstream of the water-gas shift catalyst zone (C6/L32-67);
- at least one water-gas shift catalyst disposed in said water-gas shift catalyst zone (C6/L32-67);
- at least one methanation catalyst disposed in said methanation catalyst zone (C6/L32-67).

Regarding claims 1-2 while Edlund et al. does not explicitly disclose a mixed catalyst zone between the water-gas shift catalyst zone and the methanation catalyst zone, wherein a mixture of

Art Unit: 1764

said at least one water-gas shift catalyst and said at least one methanation catalyst disposed in said mixed catalyst zone and said mixture comprises a catalytic gradient whereby a concentration of said at least one methanation catalyst increases in a direction of said methanation catalyst zone, since the reference discloses a bed of water-gas shift catalyst followed by a bed of methanation catalyst (see C6/L32-67 and Fig. 17), presence of said mixed catalyst zone having catalytic gradient is inherent in the disclosed apparatus.

Regarding claims 5-6, Edlund et al. discloses an apparatus for conversion of hydrocarbon fuel to a fuel gas comprising:

- a reformer vessel (52) suitable for reforming said hydrocarbon fuel to a reformed gas mixture comprising CO, CO<sub>2</sub>, H<sub>2</sub>O and H<sub>2</sub>;
- a reactor vessel (56) having a water-gas shift catalyst zone and a methanation catalyst zone downstream of said water-gas shift catalyst zone in fluid communication with said reformer vessel (C6/L32-67); and
- at least one water-gas shift catalyst disposed in said water-gas shift catalyst zone, at least one methanation catalyst disposed in said methanation catalyst zone (C6/L32-67).

Regarding claims 5-6 while Edlund et al. does not explicitly disclose a mixed catalyst zone between the water-gas shift catalyst zone and the methanation catalyst zone, wherein a mixture of said at least one water-gas shift catalyst and said at least one methanation catalyst disposed in said mixed catalyst zone and said mixture comprises a catalytic gradient whereby a concentration of said at least one methanation catalyst increases in a direction of said methanation catalyst zone, since the reference discloses a bed of water-gas shift catalyst followed by a bed of methanation catalyst (see C6/L32-67 and Fig. 17), presence of said mixed catalyst zone having catalytic

Art Unit: 1764

gradient is inherent in the disclosed apparatus.

Regarding claims 3-4 and 7-9, Edlund et al. discloses all of the claim limitations as set forth above. Additionally the reference discloses the reactor wherein:

- wherein said at least one water-gas shift catalyst comprises Cu and Zn (C6/L57-67); and
- wherein said at least one methanation catalyst is selected from the group consisting of nickel, iron, ruthenium, platinum, rhodium and alloys and combinations thereof (C23/L33-56).

***Conclusion***

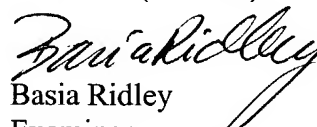
8. In view of the foregoing, none of the claims are allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

  
Basia Ridley  
Examiner  
Art Unit 1764

BR  
August 6, 2004